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R. GILPIN
Dec. 27 1912

BROOMELL VAPOR SYSTEM of HEATING

The Broomell
Vapor Heating System



distributes heat by means of radiators, such as are used on hot-water systems. Into these radiators vapor is conveyed by pipes, from a regular steam boiler or heater; or from a central heating station. Or exhaust steam may be used.

The term "Vapor," as employed in relation to THE VAPOR SYSTEM, indicates heat in a very familiar form —namely, the vapor arising from hot water and not under pressure.

THE VAPOR SYSTEM has the widest range of usefulness. It is adapted to structures of every class, regardless of size, location or exposure.

THE VAPOR SYSTEM is as readily obtainable in Chicago, in Denver, in Portland—anywhere, as in Philadelphia.



VAPOR HEATING COMPANY

The Broomell Vapor System

THE NORTH AMERICAN BUILDING
PHILADELPHIA

The Broomell
Vapor Heating System

The VAPOR specialties, which are essential to the installation of THE VAPOR SYSTEM, and which are exclusively manufactured by the Vapor Heating Company, consist of:

The combined Receiver, Draft-regulator, Gauge and Relief-valve. Which is attached to the boiler and regulates the fire.

The Quintuple Radiator-valve. Which controls the flow of Vapor into the radiators, and regulates the amount of heat.

The Special Union Elbow. Attached to the outlet of each radiator.

Detailed descriptions of these parts and of their offices, will be found farther on.

What Does it Cost to Install The Vapor System?

The cost depends on size of plant; that is, on the number of radiators and amount of heating surface necessary in each individual case. As a rule, the cost to install a medium size VAPOR plant is practically the same as for a first-class hot-water open-tank system of the same size. On large plants the cost of VAPOR should be less than hot-water. The larger the VAPOR plant, the greater the economy.

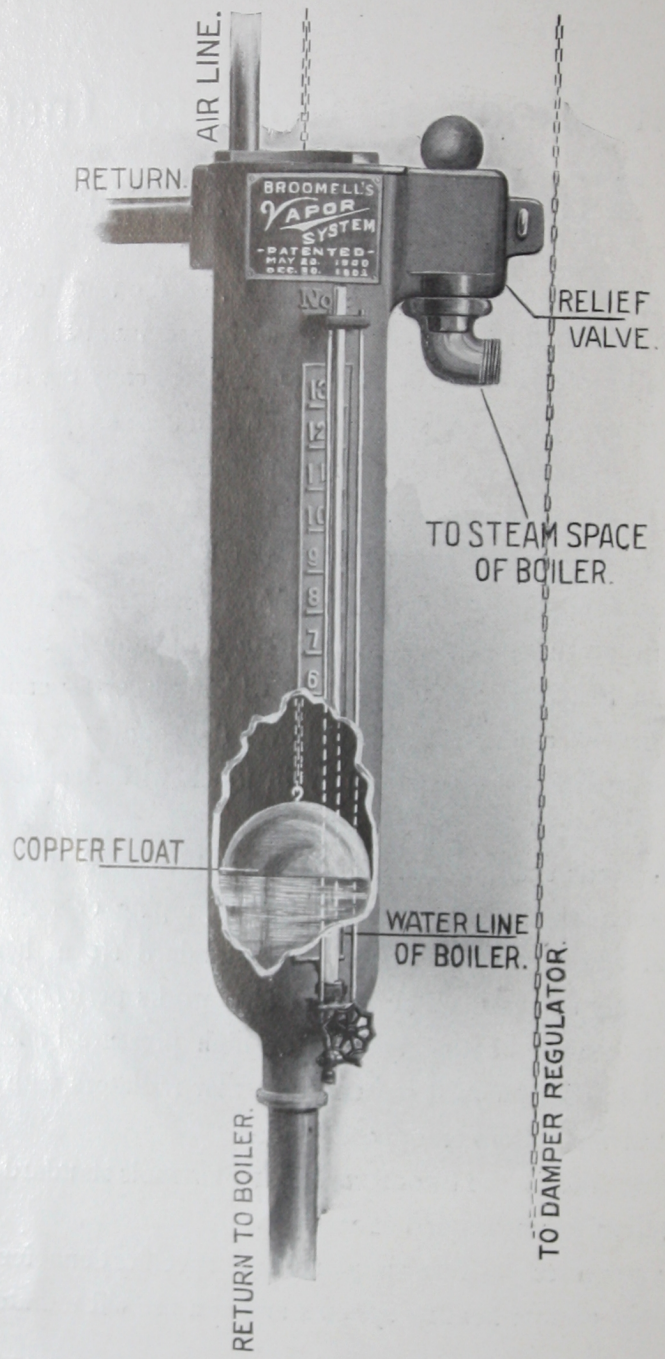
The Vapor Heating Company does not install heating systems. It is the aim of the Company to work through Architects and Heating Contractors. The main office of the Vapor Heating Company is located in The North American Building, Philadelphia, to which all correspondence should be directed. Branch offices are scattered over the country at various points, enabling the Company to come promptly in touch with Architects, Heating Contractors and Prospective Purchasers.

We manufacture all of the VAPOR specialties used in installing the system. We do not manufacture or sell boilers, piping or radiators nor do we recommend any particular make. Any standard steam heating boiler of proper size may be used. The system also works perfectly with exhaust steam, or from central heating stations or high pressure boilers. In new work we prefer to use standard pattern hot-water radiators with inlet at the top and outlet at the bottom on opposite ends.

The piping used on the BROOMEL VAPOR SYSTEM is standard, but smaller than that required for steam or hot water.

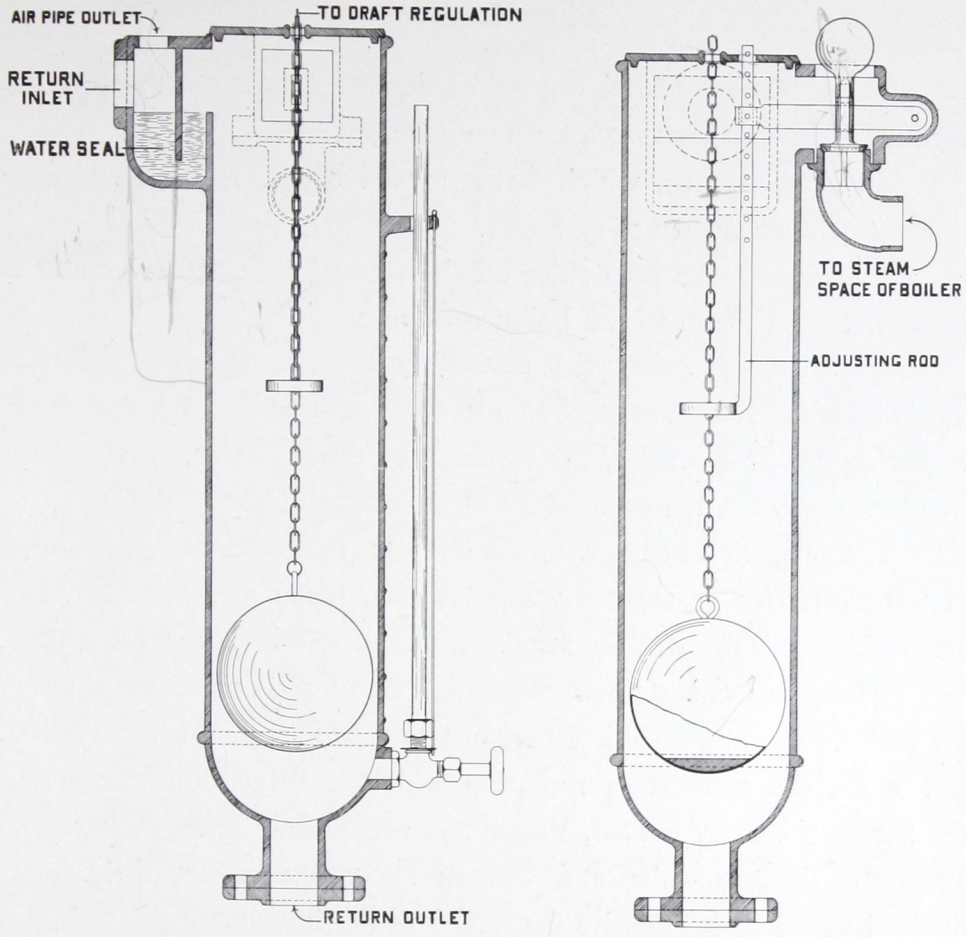
We are prepared to furnish plans and specifications for re-building defective and out-of-date heating systems and can use old radiators.

VAPOR HEATING COMPANY
PHILADELPHIA



The Receiver

The apparatus illustrated above, and shown in detail on the opposite page, is known as the Receiver. It regulates the boiler drafts and governs the operation of the system.



The Receiver is placed alongside of boiler with the zero mark on the gauge of the Receiver on a level with the water-line of boiler. The connection marked "return to boiler" is carried into the main return inlet of boiler. Since the Receiver is open to the atmosphere, there is free passage of water from Receiver to boiler, and from boiler to Receiver, through the "return to boiler" connection just described.*

The main return of the system is connected into a seal at back of Receiver at top. All condensation is delivered into this seal and is returned to boiler by gravity through the open Receiver and "return to boiler" connection. The seal is shown clearly in the first of the above drawings.

* See illustration of boiler connections on page 12.

The Receiver

(Continued)

An air-line runs from the top of the seal and is carried into the chimney, first passing through a condensing coil.

The Relief-valve, which forms a part of the Receiver, is connected to the steam space of boiler.

A heavy copper float rides on the water in the Receiver and is connected by a chain to the boiler drafts.

It is in this Receiver that one of the most conspicuous points of superiority of THE VAPOR SYSTEM centres; that is, *the practically perfect automatic control of the boiler*. No other device, invention or system approaches it in reliability of boiler regulation.

The operation of the drafts is simple: It should be remembered that there is free passage of water between boiler and Receiver, and that the latter is open to the atmosphere. It will be understood, then, that as long as the system is consuming all of the Vapor generated in the boiler, the water-level in Receiver will remain the same as in boiler. But when the amount of radiation which is turned on throughout the building is fully heated, Vapor will accumulate in the boiler. As a result of the accumulation of unused Vapor, the surface of the water in the boiler will be slightly depressed while the surface of the water in the Receiver will be elevated. When the water is elevated in the Receiver, as described, the float is raised, closing the boiler drafts by the connecting chain.

When it is desired to reduce the amount of heat, and for that purpose the radiator-valves are partially closed, restricting the flow of Vapor into the radiators, the Draft-regulating float is operated automatically in the manner already described and the fire controlled to produce just sufficient Vapor to fill the amount of radiation turned on. This is a practical illustration of the *fuel economy* of THE VAPOR SYSTEM.

On the other hand, when more heat is desired and the radiator-valves are opened, increasing the flow of Vapor into the radiators. The boiler is thus freed of accumulated Vapor, the water returns to

The Receiver
(Continued)

normal level, the float falls in the Receiver, the drafts are opened and the fire stimulated.

The Receiver can be set to close off the draft at any point between zero and 12 ounces. In moderate weather it is usually set to close the draft on 1 to 2 ounces. In extreme weather it can be set to close the draft at 4 to 6 ounces, as may be desirable. Only sufficient boiler pressure to operate the drafts is required by THE VAPOR SYSTEM. The glass gauge on Receiver indicates ounces of vapor in the boiler.

The Relief-valve (see drawings page 5) is provided to prevent any possibility of water overflowing the top of Receiver. If by neglect the ash-pit doors were left open, thus nullifying the automatic draft regulation, the water will continue to rise in the Receiver carrying with it the float which has already closed the draft. The float will presently lift the lever opening the Relief-valve and releasing the vapor from the boiler. The "adjusting rod" is usually set to open the Relief-valve at 7 to 10 ounces.

The fire door and ash-pit door are kept closed. The boiler is regulated entirely by the Receiver.

The Vapor Radiator-valve



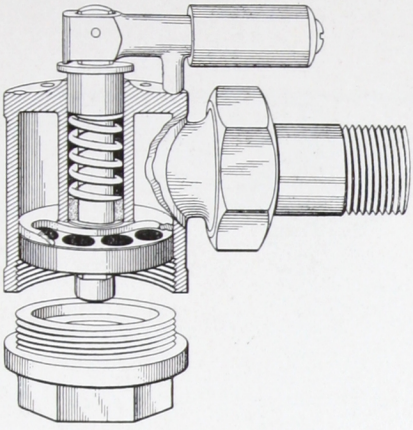
Position of handle indicates ¾ open

The Quintuple Valve regulates the temperature of the radiators. It is the only Radiator-valve with which such regulation is possible. It can be instantly and easily set to admit more or less Vapor; to heat the radiator in part; to heat it a little more; to heat it much more; and finally, to bring the radiator up to the maximum temperature.

This, of course, means that the Quintuple Valve differs altogether from the ordinary radiator-throttle. Experts pronounce it the most perfect valve for the purpose that can be designed.

To deliver Vapor to the radiator the handle is moved around one point; this opens a port in the valve-disc. If more heat is wanted the handle is moved to the next point. Still another move gives a three-fourths opening, as in illustration. To give the valve full opening, the handle is turned half around until it stands toward the radiator; in such position the four delivery ports are open.

Aside from being an excellent example of mechanism, the Quintuple Valve is handsomely finished. Very heavy and substantial, the finished parts all nickel plated, highly polished. The handle finished in ebony. It is perfectly steam tight, is self-packing in the valve stem, and can be set with the thumb and finger. When the valve is connected up, the supply pipe is screwed into the bottom, and the nipple of the valve is screwed into the radiator.



Quintuple Valves are in six sizes for three-fourth inch pipe. These valves are so made as to deliver the quantity of Vapor necessary to heat the radiators on which they are placed. In other words, the size of the openings in valve corresponds to the size of radiator.





The attractive home of F. A. Dalton, Haddam, Conn.—exposed on all sides, to the rigors of the good old-fashioned New England winters, is kept warm and comfortable, by VAPOR. The contrast between the two scenes emphasizes the range of weather in New England.

Hartford Heating Co., Heating Contractors.



The ordinary Radiator-throttle

The Vapor Radiator-valve

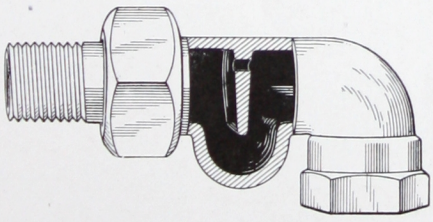
This illustration shows without argument the advantage from a woman's standpoint, of THE VAPOR SYSTEM Radiator-valve. Not only are the radiator-valves on other systems awkward, but they are frequently impossible to operate by one of ordinary strength of hand and arm.

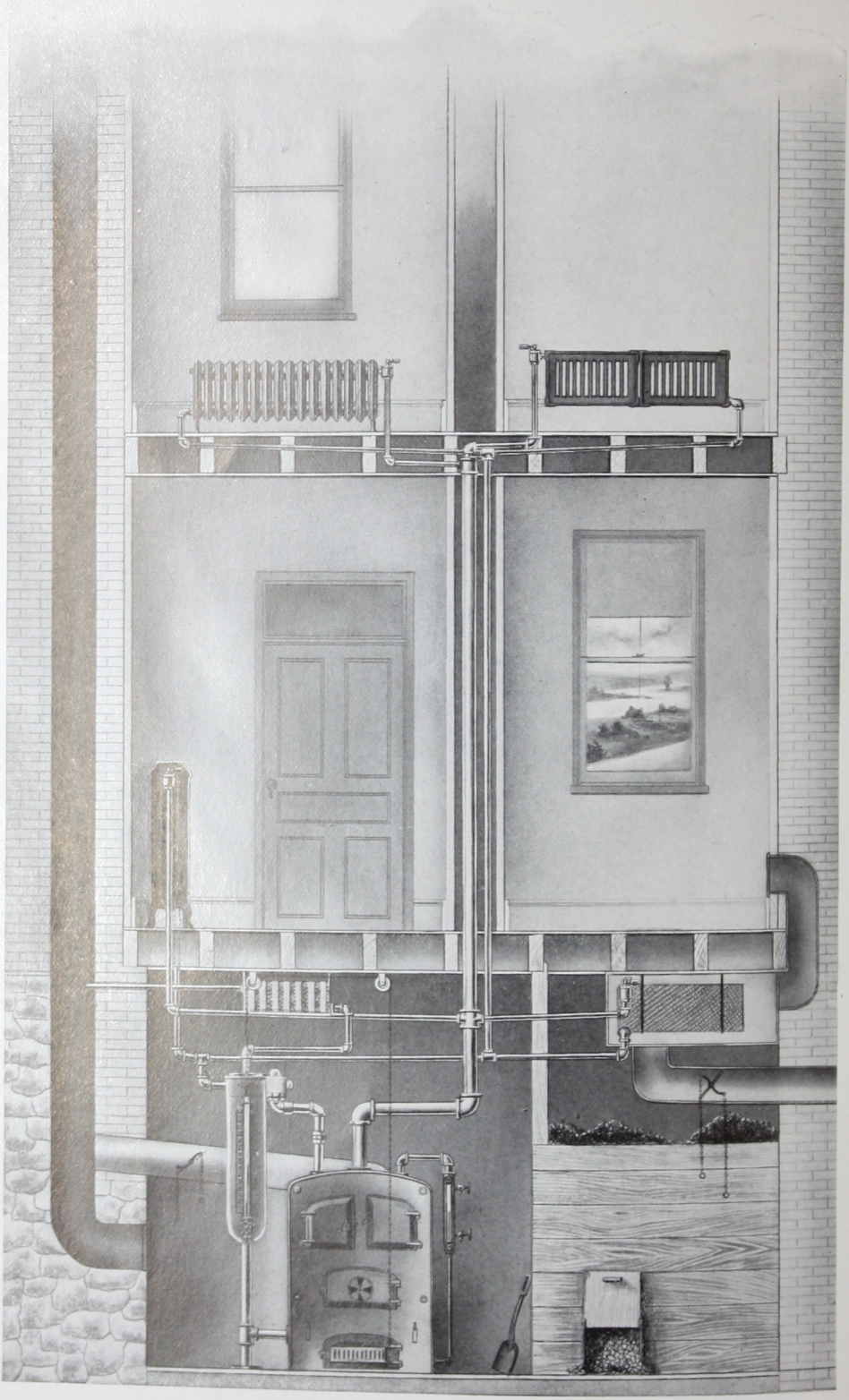
The Vapor System



UNION ELBOW RETURN.

The return end of all radiators must be connected to the return pipes by the Broomell Improved Union Elbow. This elbow is of special design and is so constructed that condensation is freely discharged from the radiators through the seal in the elbow, the air being exhausted through the outlet above the seal. From this point air and condensation are taken back in the main return pipe to the seal at top of Receiver.





The Vapor System Boiler Connections and Piping

The Vapor System Boiler Connections and Piping

Vapor ascends from the top of boiler through the main supply and through branch supply pipes to the radiators. When it condenses, the water returns to Receiver through the smaller pipes. The air is also removed from the radiators through the return piping. It will be remembered that no air-valves are used on radiators of THE VAPOR SYSTEM.

The illustration shows both direct and indirect radiation: Direct indicating the presence of radiators in the rooms; indirect indicating the arrangement of an encased radiator beneath the floor, from which heated air—the air being first taken from out of doors—is conducted to the room above.

How the Air is Removed

The Condensing Coil will be observed above the Receiver. The air is removed from the radiators by the return piping, delivered into the seal on Receiver, and discharged from the seal into the Condensing Coil. From the top of the Condensing Coil on opposite end from connection to Receiver the air-line is run into the chimney. This creates a pull and a partial vacuum through the entire system, equal to the draft of the chimney, exhausting the air from the radiators and pulling the Vapor into them when radiator-valves are opened.

The Condensing Coil eliminates any possibility of moisture entering the chimney.

The Vapor System; how it works

By considering the illustrations and descriptions of Receiver, Quintuple Valve and Boiler Connections, together with the following explanation, the operation and self-regulation of THE VAPOR SYSTEM should be readily understood.

First, water is let into the boiler, filling it to the proper level. A fire is started. Soon the water vaporizes. Then vapor ascends in the supply pipes and enters the radiators. It does so in a natural way. The vapor is not forced through the system. There is no pressure, as with other systems. Moreover, it has no air resistance to overcome. Air is removed from all radiators through return piping and delivered into the seal on Receiver, from where it is carried into the chimney, passing through Condensing Coil. The draft in the chimney gives at all times an ample pull to free the entire system of air. And it serves also to pull the vapor rapidly into the radiators. The air being thus exhausted from THE VAPOR SYSTEM no air valves are needed on radiators.

The water of condensation returns by gravity through the small pipes (see illustration page 12) to the Receiver and from Receiver goes back into the boiler. Water cannot accumulate in radiators or pipes.

It will be seen at once that THE VAPOR SYSTEM has a natural, and therefore ideal circulation.

Vapor ascends in the pipes because it is natural for vapor to go up.

Condensation returns because it is natural for water to run down.

The air is exhausted from the system by means of the chimney connection because it is natural for air to be drawn into a chimney.

The VAPOR SYSTEM; how it works

(Continued)

In self-regulation (boiler control) THE VAPOR SYSTEM is as superior as in its circulation. With the gradual heating up of the radiators is a gradual checking of the fire. Little by little the draft is shut off. When the system is in full operation, the draft-regulating apparatus works continuously,—a little more, a little less fire as is required to produce Vapor in proportion to its consumption.

Now, the radiators becoming thoroughly heated, cease to consume all the Vapor the boiler is producing. Thus follows an increase of the Vapor in boiler, depressing the water there and elevating it in the Receiver, the latter being open to the atmosphere. The draft-regulating float in Receiver is carried upward, operating the draft, checking the fire, and reducing the production of Vapor to an amount necessary to keep the system filled. It should be noted that the Receiver of THE VAPOR SYSTEM constitutes the *most satisfactory and reliable automatic draft-regulator yet devised, opening and closing the draft on change of two ounces of pressure, and at any point between zero to ten ounces on boiler.*

In the event of a continued increase in pressure after the draft is closed, as would result from neglect to close ash-pit door, the rising water in Receiver will carry the draft-regulating float up until it operates the Relief-valve. Escape of the excess Vapor from the boiler will immediately reduce the pressure; then the water in Receiver will drop and Relief-valve will close.

The distance between water-line of boiler and extreme high-water in the Receiver is never more than eighteen inches. The

maximum pressure, therefore, that can ever be on the boiler will equal a column of water eighteen inches high, or less than three-quarters of a pound per square inch.

It should be emphasized that any radiator on THE VAPOR SYSTEM, may be used independently of any, or of all others.

And that the temperature of every radiator may be regulated to meet the necessity of the moment, as explained in the description of Quintuple Valve.

The boiler-regulating apparatus responds as perfectly when Radiator-valves are partly opened as when fully opened. With quarter-open valves, Vapor is produced to heat a fourth (approximately) of the surface of the radiators; then the fire is automatically checked, as has been described. The same applies to half-open valves with half of the radiation heated; and to three-quarters open valves with three-fourths of the surface heated. So sensitive is the regulating apparatus that the opening or closing of an individual Radiator-valve acts on the fire, checking it or stimulating it as the case may be. Thus, there can be no excessive consumption of fuel with THE VAPOR SYSTEM.

With THE VAPOR SYSTEM heat is produced in the exact ratio that heat is consumed. There is no waste. Never too much, yet always plenty. The amount of heat is limited only by the requirements of the weather.

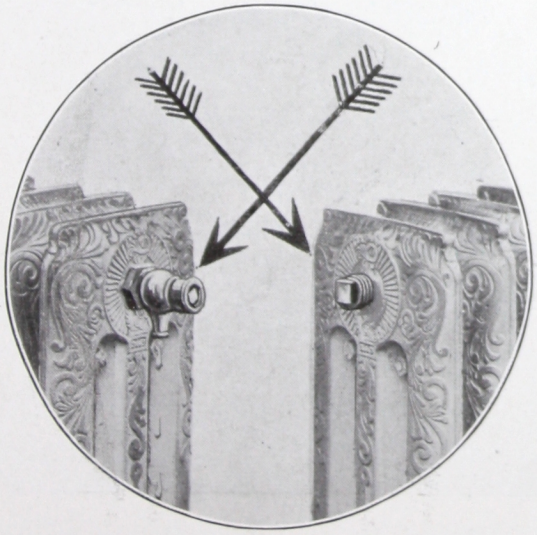
THE VAPOR SYSTEM; how it works

(Continued)

The efficiency and convenience of THE VAPOR SYSTEM is conspicuously demonstrated by extreme requirements. Other systems are usually insufficient in very severe weather, and are rarely temperate enough for mild days.

The advantages of THE VAPOR SYSTEM are appreciated no less in the early fall and late spring than in mid-winter. In the seasons of warm days and cold nights a little heat is needed morning and evening to take off the chill, but none during the day. Neither steam nor hot-water meets this need. With THE VAPOR SYSTEM simply open the boiler door and pipes and radiators become cold; close the door and the system is heated again—in fifteen to twenty minutes.

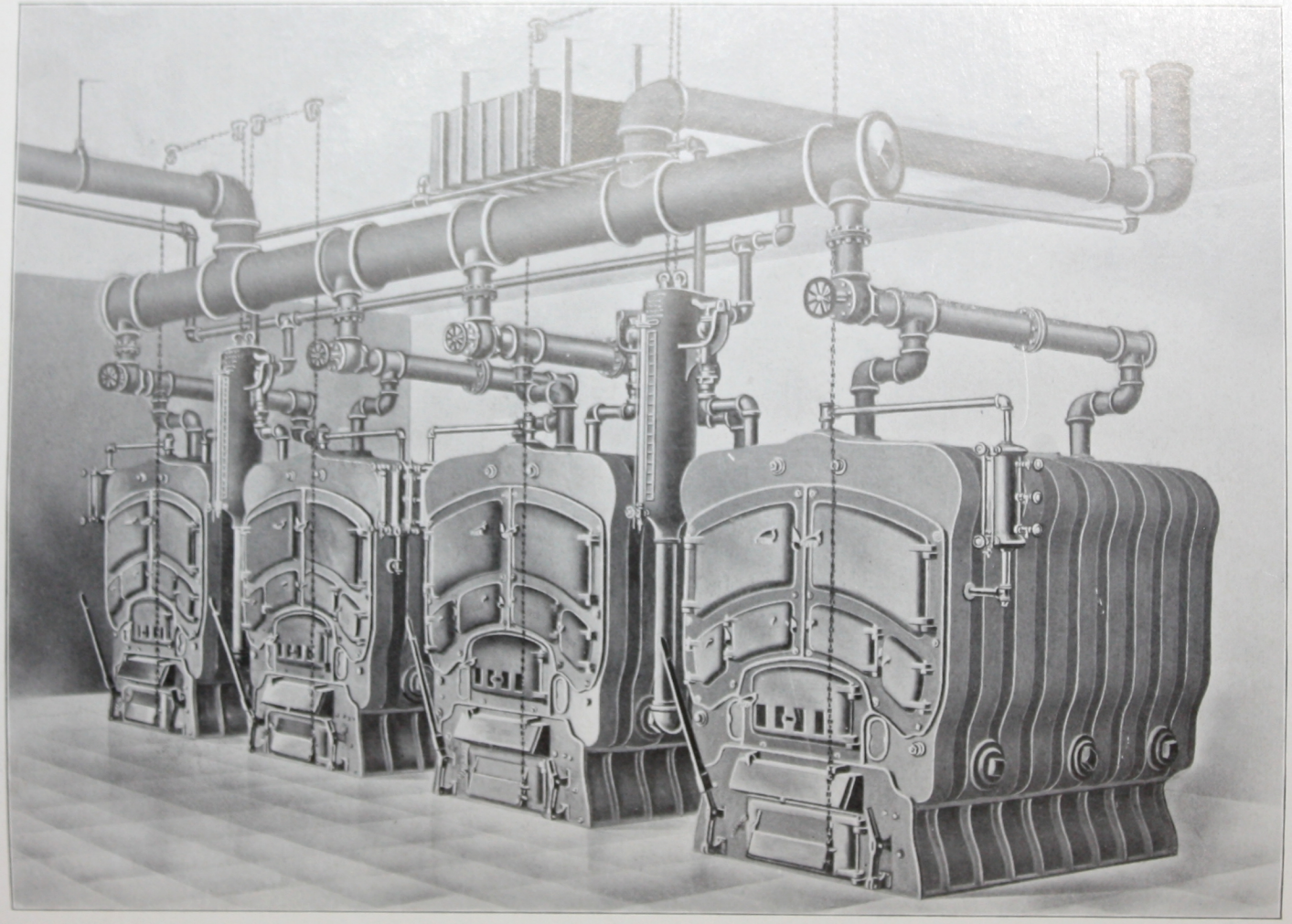
VAPOR HEATING COMPANY
PHILADELPHIA



Which?

No Air-valves with Vapor

A plug takes the place of the air-valve on radiators. No water, no noxious gases can escape from radiators on THE VAPOR SYSTEM, as on steam and hot-water.



BOILER SETTING—CENTRAL PLANT, BROOMELL VAPOR SYSTEM

Arrangement of boilers for large institutions, hotels or buildings requiring a central heating plant capable of heating large areas

The Vapor System Compared

with steam and hot-water systems

THE VAPOR SYSTEM needs only ounces of pressure, and that in the boiler alone—for the purpose of regulating the draft. There is absolutely no pressure on the radiators.

A steam system

requires pounds of pressure, as against ounces with VAPOR. Boiler pressure on a steam system is exerted on pipes and radiators, the system being closed, since both supply and return are connected directly to boiler. And where there is pressure on piping it is very difficult to eliminate the snapping, cracking noises incident to pressure expansion and the subsequent contraction. With THE VAPOR SYSTEM pressure on boiler is limited to the amount necessary to operate drafts, say two to six ounces. The radiators are at all times free of pressure, since the return line is open to the atmosphere.

A hot-water system

first, is required to withstand the great weight of the water with which it is filled. Without warning and without apparent cause, a fitting will break, a radiator loop split, bonnet of valve come off, or one of many things may happen, causing damage to the building and furnishings, and involving costly repairs.

Then, provision must be made for expansion, the water when heated expanding about 1-25 of its volume. Accordingly, hot-water systems are erected with an expansion tank or on the closed system with relief valve. Both plans are open to serious objections.

An expansion tank must be located above all radiators, and often where it is difficult to

prevent freezing. In cold weather care must be taken to maintain circulation throughout the entire system; all radiator valves must be kept open, and air-valves must be opened frequently. Without this precaution, not only expansion tank but radiators and pipes will freeze and burst. Or, should the fire burn up, and the water get too hot, it will boil in expansion tank, and frequently out over the sides of the tank, flooding everything below.

If a relief valve is used, it may fail to work, as these valves often do, throwing too much pressure on the system, with a result that radiators or pipes burst, and a flood follows as a matter of course.

Above all things, a closed hot-water system, running under pressure, is to be avoided.

Accidents usually happen during the coldest weather, involving not only loss by the damage done and expense of repairs, but great personal inconvenience.

Steam systems

THE VAPOR SYSTEM operates *without air valves on radiators.*

with the exception noted below, require every radiator to be provided with an air-valve. Automatic valves, being delicate pieces of mechanism, need adjustment and care by an expert; otherwise they cease to be automatic, and are a source of continual trouble. Not infrequently a room is flooded, and floor-coverings are ruined, by water escaping through an automatic valve. If hand air-valves are used, it is necessary to open them in the morning, or every time steam goes down in

the boiler; otherwise radiators will not heat when steam is again made. Air-valves are also highly objectionable because of the noxious gases they discharge.

With a steam system, in which an air pump is employed, air-valves on radiators are dispensed with, but such a system is only feasible where a professional engineer is employed.

The hot-water system

also requires air-valves. These valves are opened and closed by hand. There is always the chance that an air-valve will be left open by oversight. And it generally happens that the valve so left open is in a place where the most serious damage results.

THE VAPOR SYSTEM operates noiselessly.

The steam system

is capable of producing the most distressing noises imaginable. Everyone is familiar with the nerve-jarring rattle, thump and jump of steam pipes and radiators, caused by contact of cold water and live steam.

THE VAPOR SYSTEM operates automatically, requiring attention only to fuel and ashes.

The steam system

cannot be trusted to automatic control, but—whether double-valve, single-valve, or vacuum—requires constant watching and attention.

The hot-water system

is also without satisfactory automatic control because, thus far, no damper-regulator has been devised that will automatically regulate the draft in a hot-water heater. This is a serious objection,

making it necessary for some one to visit the heater several times a day, to properly set dampers and control fire.

The steam system

is universally criticized because it is either "too cold" or "too hot." The theory when heating by steam is to use a radiator of sufficient size to heat the room in coldest weather. It follows, necessarily, that radiator is too large for moderate weather.

THE VAPOR SYSTEM admits of regulation of heat in each radiator, by means of its superior radiator valve.

It is impossible to regulate the amount of steam delivered to radiators, working on the gravity system. If the supply valve is partially shut, in an attempt to control the temperature of the room by admitting less steam, the radiator will not work properly and in a short time will fill with water. The valves must be wide open, or entirely closed.

The hot-water system

in respect to the regulation of heat, is an improvement on steam, but not more so than THE VAPOR SYSTEM is on hot-water. In hot-water heating, temperature changes are very slow. When the weather is extremely cold, or the fire is low, and the water-temperature has fallen, it takes the greater part of the day to get up enough heat for comfort. On the other hand, when the house becomes over-heated, as is likely toward evening, it takes about as long to reduce the temperature of the water with which the system is filled. Windows are impatiently thrown open, causing drafts and endangering health. With

THE VAPOR SYSTEM you can have as much heat, or as little, as conditions require, and without delay.

The hot-water system

is of course, filled with water. The dangers from the weight of the great volume of water in pipes and radiators, and of the evils of the expansion of this water, have already had comment.

THE VAPOR SYSTEM accumulates no water in radiators or pipes.

The steam system

constantly accumulates water in radiators and pipes. If automatic air-valves are on radiators the water soon reaches them and escapes; carpets, furniture and ceiling are ruined. After a radiator has filled with water and a valve is opened to again heat it, the water passing from radiator and meeting hot steam in pipes below, makes a dreadful noise.

The hot-water system

sustaining, as it does, tremendous pressure, is liable to accident at any moment, as already pointed out.

THE VAPOR SYSTEM is safe and dependable — no pressure to break radiators, crack pipes or strain boiler.

The steam system

being also under pressure (unless operated by machinery producing a vacuum), is subject to accidents similar to the hot-water system. But the chief source of trouble is the boiler. One radiator filling with water may take out of the boiler sufficient to bring the water line below crown sheet or other exposed surface. If the

boiler is cast-iron it is almost certain to crack. A steel boiler blisters and finally collapses.

The attendant, noticing that the boiler has suddenly lost water, should locate and open the radiators which contain this water. Instead of doing so, however, he is more likely to take the easier way—he fills the boiler to the proper point. Later, someone opens the flooded radiators, all the water returns to the boiler, perhaps filling it above steam outlet, stopping circulation of steam and causing a tremendous pounding in the piping. Or, should the lack of water in boiler remain unnoticed, and a flooded radiator be opened, the water will rush into the boiler over the very hot surfaces, and be instantly converted into steam, at a high and sometimes dangerous pressure. Boiler explosions are caused in this way.

THE VAPOR SYSTEM has quick and free circulation; much quicker and freer than either steam or hot-water.

The steam system

presents engineering difficulties in circulation to which steamfitters are not always equal. Even when perfectly installed, serious interruption to free circulation is caused by the shutting off of radiators in overheated rooms. A closed radiator here and there on a system may stop circulation altogether.

On steam systems

circulation is constantly interrupted by the presence of water and air in pipes and radiators, unless operated by machinery.

With THE VAPOR SYSTEM, simply open the valve and the radiator heats up at once—no

water there, nor even air that can obstruct or interfere with the Vapor. The chimney suction on end of air line exhausts the air and draws the Vapor into radiators.

The steam system

THE VAPOR SYSTEM'S radiator valves are never troublesome. They turn at the touch of the finger.

with two valves, makes it necessary, when a radiator is shut off, to close both throttles. If either one be left open, the radiator will fill with water. The valves, being opened and closed so frequently, soon become defective and leak sufficient steam to fill the radiators with water. This continual opening and closing also wears out the packing around valve stems, making it necessary to have them repacked; otherwise there is a continual leakage of steam into the room.

The single valve system reduces the labor, somewhat, but the same annoyance remains, not the least of which is that, when opened, or closed, the services of someone with an unusually powerful hand and strong arm are required to again move the valve.

A hot-water system

THE VAPOR SYSTEM is more economical, —produces better results in proportion to fuel consumed than either hot-water or steam.

requires the same type of radiator-valve as steam. With both hot-water and steam the valves are placed near the floor, whereas, with VAPOR the valve is at the top of radiator in easy reach. The pressure of a finger is sufficient to turn it.

This is, of course, the logical result of the combined points of superiority.

THE VAPOR SYSTEM compared with steam and hot-water systems

(Continued)

THE VAPOR SYSTEM saves on fuel because it operates without pressure; because of the practically perfect automatic control of boiler; because of the accurate regulation of heat; because no water can accumulate in radiators and pipes; because the circulation is quicker and freer; and, because there is no waste.

THE VAPOR SYSTEM is superior in the quality of heat.

It is always temperate. It does not run to extremes; it is never violent, never deficient. On the bitterest days, there is ample for healthful warmth; in mild weather, there is just enough for comfort. THE VAPOR SYSTEM responds to every change of weather.

"Far less troublesome than ordinary hot-air furnace"

The advantages claimed for THE VAPOR SYSTEM, after thorough investigation of all the up-to-date methods of heating, induced me to adopt it.

The following are some of the many advantages, I think, over all other systems:

1. A perfect control of the temperature in any part of the house by a simple device attached to every radiator.
2. Entire absence of noises in the pipes, such as hissing, rumbling, etc.
3. The impossibility of freezing, leakage or bursting. On the coldest day when the boiler was at its best the pressure did not exceed two ounces at any time.
4. Even distribution of heat throughout the house night and day, insuring a continuously warm house.
5. A slightly moist heat permeates the whole house.
6. Absolute cleanliness.
7. Simplicity of construction and ease of handling—far less troublesome than ordinary hot-air furnace owing to its automatic attachments.

—E. F. Biscoe, M. D., 2311 North 33d Street, Philadelphia

SPECIAL NOTICE

THE Vapor Heating Company is the exclusive owner and manufacturer of the Vapor specialties used with THE BROOMELL VAPOR SYSTEM. It acts as engineer, taking all responsibility in connection with this System, if properly installed according to plans and specifications: Any deficiency in radiation, or any fault due to mistake in plans and specifications that may be discovered in the completed work, will be corrected without charge to the Owner, Heating Contractor or Architect, provided full, complete and correct data has been furnished.

Owners, Architects and Heating Contractors are requested to send drawings or blue prints of buildings in which they want to install THE BROOMELL VAPOR HEATING SYSTEM. On receipt of such drawings or prints, the Vapor Heating Company will make complete plans, showing sizes of all radiators, piping, etc.; and will furnish complete specifications setting forth in detail how the work must be installed. These plans and specifications can then be submitted to any number of Heating Contractors and bids obtained for the work.

The Architect is thus relieved of the work and responsibility of getting up heating plans and specifications. This method is also to the advantage of the Heating Contractor for the reason that he is called on to put in only what is specified and shown on the plans. If the work is properly done, the responsibility of the Heating Contractor ceases.

By this method the Owner has the advantage of competitive bids—is certain to get a first-class job at a fair price, and is protected from any loss or uncertainty as to the operation of the system, or proper heating of the building, by the Vapor Heating Company, which, as above stated, assumes all responsibility for the operation of the system, if installed in complete accordance with its plans and specifications.

The Vapor Heating Company does not act as superintendent, nor does it assume responsibility for the quality or operation of the different parts supplied other than the VAPOR specialties. The responsibility of the Vapor Heating Company extends only to seeing that the boiler, the radiators, the valves placed on the radiators, and the pipes, are of the size specified, and installed according to plans.

VAPOR HEATING COMPANY

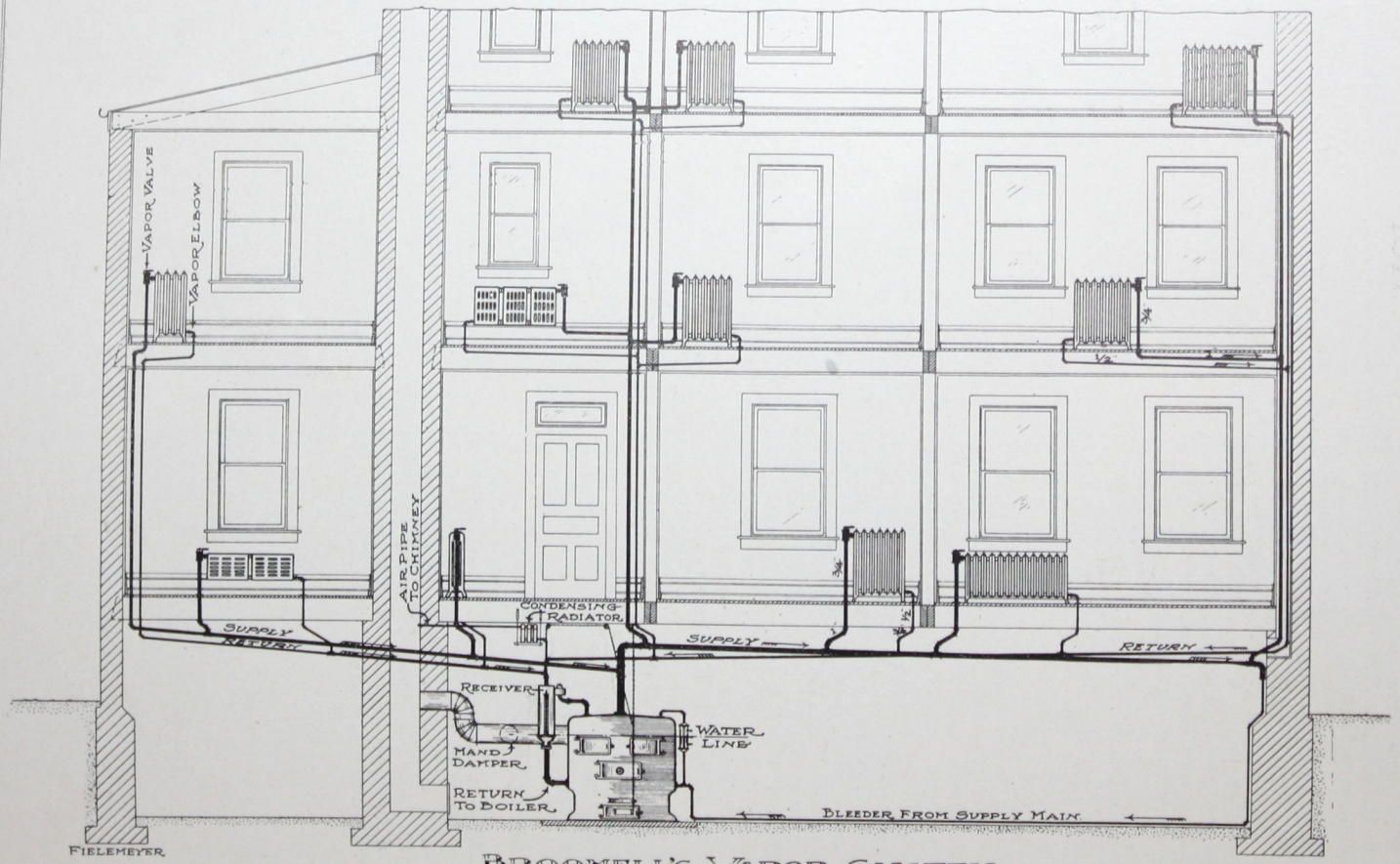
THE NORTH AMERICAN BUILDING, PHILADELPHIA

Some Heating Contractors who have Installed Broomell's System of Vapor Heating

H. C. Archibald, Jr. Stroudsburg, Pa.
S. B. Ardrey & Son Bristol, Pa.
Adams & Cline Waynesboro, Pa.
Schuler Bros. Wilkes-Barre, Pa.
Turner & Van Scoy Wilkes-Barre, Pa.
Peter Forve Wilkes-Barre, Pa.
Allen & Fell Wilkes-Barre, Pa.
H. E. Mott Dallas, Pa.
Schick & Hausman Catasauqua, Pa.
York Engineering Co. York, Pa.
George F. Motter & Sons York, Pa.
James Bros. West Chester, Pa.
George R. Oat West Chester, Pa.
Apple Plumbing & Heating Co.
West Chester, Pa.
J. W. Cuff & Co. Philadelphia
John C. F. Trachsel Philadelphia
John P. Cleary Philadelphia
Harry F. Murphy & Co. Philadelphia
Grant Jenkins & Co. Philadelphia
F. H. O'Neill Philadelphia
W. H. Palmer Colwyn, Pa.
W. M. McCormick & Co. Sharon, Pa.
F. W. Sanner Tremont, Pa.
Chas. Bieler & Son Pen Argyl, Pa.
A. R. Schad Bellefonte, Pa.
Engle & Van Danberg Reading, Pa.
Lycoming Heating Co. Williamsport, Pa.
Harrisburg Steam Heat & Power Co.
Harrisburg, Pa.
Chas. M. Froehlich Harrisburg, Pa.
R. W. Sheaffer Harrisburg, Pa.
L. L. Lord Co. Meadville, Pa.
Gibson Bros. Homestead, Pa.
George T. Sellers Gap, Pa.
James D. Scott Coatesville, Pa.
John H. Buohl Mt. Joy, Pa.
Anderson-Darragh Co. Pittsburg, Pa.
Seligman & Co. Tamaqua, Pa.
Wayne Electric Light & Steam Heat Co.
Wayne, Pa.
E. D. Bartholomew Mauch Chunk, Pa.
George K. Morris North Wales, Pa.
Hersh & Bro. Allentown, Pa.
Schellhammer & Son Warren, Pa.
Albert Deal State College, Pa.
M. D. Gould Moores, Pa.
Sloan Heating & Ventilating Co.
Pittsburg, Pa.
Wm. E. Wood Co. Baltimore, Md.
Armstrong Stove & Mfg. Co.
Baltimore, Md.
Enterprise Steam & Hot Water Heating Co.
Baltimore, Md.
Chas. A. Howard Annapolis, Md.
Hagerstown Heating Co. . Hagerstown, Md.
Cyrus B. Rees Washington, D. C.

A. J. Kennard Roanoke, Va.
W. P. Longworth & Co. Richmond, Va.
J. R. Rich Asheville, N. C.
J. C. McPherson Asheville, N. C.
G. L. Guischard Asheville, N. C.
Smith & Guest Atlanta, Ga.
Hill Bros. Waco, Tex.
Braden-O'Neil Plumbing & Heating Co.
San Antonio, Tex.
Hoerner & Keller Dayton, O.
McDermont & Clemens Dayton, O.
M. J. Gibbons Dayton, O.
Staniland & Schneble Dayton, O.
John Conners Cincinnati, O.
J. H. Brinck Cincinnati, O.
The Oliver Schlemmer Co. .. Cincinnati, O.
Thos. J. Nichol & Co. Cincinnati, O.
Geerin Bros & Co. Cincinnati, O.
The Quay Engineering Co. Cleveland, O.
Mitchell Plumbing Co. Springfield, O.
John Sturrock Helena, Mont.
Adams Plumbing-Heating Co.
Helena, Mont.
I. Krueger Butte, Mont.
John A. Collins Great Falls, Mont.
Reeder & Budd Bozeman, Mont.
Miles & Ulmer Miles City, Mont.
W. G. Long & Son Chadron, Neb.
A. Dussell & Son Columbus, Neb.
Aug. Lubeley Hartington, Neb.
L. W. Pomerene Co. Lincoln, Neb.
Frank L. Boyer West Point, Neb.
M. Isbister Heating & Plumbing Co.
Spokane, Wash.
Arnold-Evans Co. Spokane, Wash.
R. Weston Spokane, Wash.
Muirhead & Murhard Co. .. Portland, Ore.
Kendall Heating Co. Portland, Ore.
Thos. E. Hulme & Co. Portland, Ore.
Cox & Stone Providence, R. I.
Samuel Jackson Co. Pawtucket, R. I.
Hartford Heating Co. Hartford, Conn.
Parker & O'Conner ... New Britain, Conn.
John K. Allen Greenwich, Conn.
T. P. Terry & Son Ansonia, Conn.
J. Reilly, Jr. Bridgeport, Conn.
C. S. Earnes & Co. Bridgeport, Conn.
F. A. Hull & Son Danbury, Conn.
W. C. Taylor Danbury, Conn.
The Heating & Plumbing Co.
Norwalk, Conn.
Henry Foulois Washington, Conn.
W. H. Riley & Co. Northampton, Mass.
Geo. H. McClean & Co. . Springfield, Mass.
Felten-Turner Heating Co. Boston, Mass.
Lagasse Bros. Co. Fall River, Mass.
A. Burlingame Co. Worcester, Mass.

Lloyd Perkins, 2d.....Middleboro, Mass.
John F. Cabeen.....Salem, Mass.
Walter A. Lawson.....Newark, N. J.
Worrell Shinn & Co.....Princeton, N. J.
John R. Croot.....Summit, N. J.
Banta-Owen Plumbing Co.
Ridgewood, N. J.
J. S. Burd & Co.....Pennington, N. J.
L. W. Butterfield.....Orange, N. J.
J. W. Dederick.....Elizabeth, N. J.
Fred Fink.....New Brunswick, N. J.
Chas. Grohe & Co.....Montclair, N. J.
I. Seymour Crane.....Montclair, N. J.
Wrensch Plumbing & Heating Co.
Montclair, N. J.
Wm. B. Lynch.....Riverton, N. J.
James H. Johnston.....Washington, N. J.
William O'Brien.....Red Bank, N. J.
Frank Fell & Co.....Trenton, N. J.
F. M. Groendyken.....Mendham, N. J.
Worden & Crawford Co..Jersey City, N. J.
Lawton-Tallman Co.....Jersey City, N. J.
John Doyle.....Crawford, N. J.
Piper Bros.....Trenton, N. J.
John O'Connell.....Dover, N. J.
Chas. Collinson.....West Orange, N. J.
Harry A. Miller.....Wilmington, Del.
Wm. G. Robelen.....Wilmington, Del.
B. F. Shaw Co.....Wilmington, Del.
Wm. E. Smith.....Wilmington, Del.
Robert T. Grier & Bro...Wilmington, Del.
Crooks & Co.....Wilmington, Del.
Geo. B. Ward.....Wilmington, Del.
Brison Heating & Plumbing Co.
Wilmington, Del.
George W. Taylor.....Smyrna, Del.
Davis Bros.....Middletown, Del.
Shapley & Wells.....Binghampton, N. Y.
Ellison & Co.....New York City, N. Y.
John Hankin & Bro.
New York City, N. Y.
John Boyd Plumbing & Heating Co.
New York City, N. Y.
John R. Corbin & Co.....Brooklyn, N. Y.
Cornelius Dwyer.....Amsterdam, N. Y.
George R. Wyman & Son...Nyack, N. Y.
John Anderson & Son....Flushing, N. Y.
Griffin-Travis Co.....Flushing, N. Y.
J. F. Rogers & Co.....Flushing, N. Y.
Whitney Van Wicklen.....Freeport, N. Y.
Kennedy & Purcell.....Troy, N. Y.
Estate of M. F. Meehan
Saratoga Springs, N. Y.
McCoy & Ott.....Peekskill, N. Y.
Foster & Son.....Peekskill, N. Y.
Barr & Creelman.....Rochester, N. Y.
C. R. Schaffer.....Syracuse, N. Y.
Robt. Henderson.....New Rochelle, N. Y.
James C. Farrell.....White Plains, N. Y.
George Howard.....Mt. Vernon, N. Y.
C. S. Knight.....Monroe, N. Y.
Fred. A. Tyler.....Albany, N. Y.
Jedlicka Bros.....Sayville, L. I.
E. K. Campbell Co.....Kansas City, Mo.
J. F. Roling.....Salisbury, Mo.
Kauffman Heating & Engineering Co.
St. Louis, Mo.
George E. Morlidge & Co...Newport, Ky.
Craighead Plumbing & Heating Co.
Richmond, Ind.
Carthey & Dumbek..Salt Lake City, Utah
J. M. Schaub Co.....Moundsville, W. Va.
Pekin Water Works Co.....Pekin, Ill.
Ward & McMahon.....Rock Island, Ill.
Swift & Dooce.....Chicago, Ill.
Thos. J. Douglas & Co.....Chicago, Ill.
Garretson Company....Fort Worth, Texas
Kerthly Co.....Houston, Texas
Belden-Porter-Gray Co..Minneapolis, Minn.
Sanitary Plumbing Co.....Duluth, Minn.
Des Moines Plumbing & Heating Co.
Des Moines, Ia.
Gearen & Ziegler Co.....Sioux City, Ia.
Leach & Thompson.....Spencer, Ia.
J. H. Fenton & Co.....Cedar Rapids, Ia.
Fox Heating Co.....Everett, Wash.
Potter Heating Co.....Denver, Colo.
F. W. Murdock.....Norway, Me.
L. M. Longley.....Norway, Me.
A. E. Gay.....Nashua, N. H.
Russell-Vail Engineering Co.
San Francisco, Cal.
Marvel-Spencer Heating Co.
Milwaukee, Wis.
Haslam Heating & Ventilating Co.
Providence, R. I.
E. J. Erbelding.....Augusta, Ga.
Engert & House.....Knoxville, Tenn.



BROOMELL'S VAPOR SYSTEM
SHOWING MANNER OF RUNNING PIPING
IN TYPICAL INSTALLATION

Typical Installation

In the illustration on opposite page, the supply line from left hand side of boiler pitches up-hill and supply line from right hand side of boiler, pitches down-hill.

Up-hill supply line should pitch not less than two inches in ten feet—more than this, if possible. A pitch of one-half inch in ten feet is sufficient in down-hill supply runs, but more is advisable if it can be obtained.

The return lines furthest from boiler, start as close to over-head joists as possible and pitch back to return inlet, near top of Receiver, on down-hill grade of not less than one-half inch in ten feet. Condensation flows through Receiver and is discharged into boiler, through return pipe which connects with return-inlet below boiler water line. An air pipe from top of seal on back of Receiver connects to bottom outlet of Condensing-Coil and from a top outlet of Condensing-Coil, is connected to chimney.

A bleeder-line is taken from the lowest point of down-hill supply main, connecting to a return-outlet at back of boiler. Bleeder-line to drop below boiler water-line as near to point of connection to supply as possible. If this cannot be done, bleeder may run overhead on down-hill grade toward boiler, and drop, directly at boiler, to the return inlet.

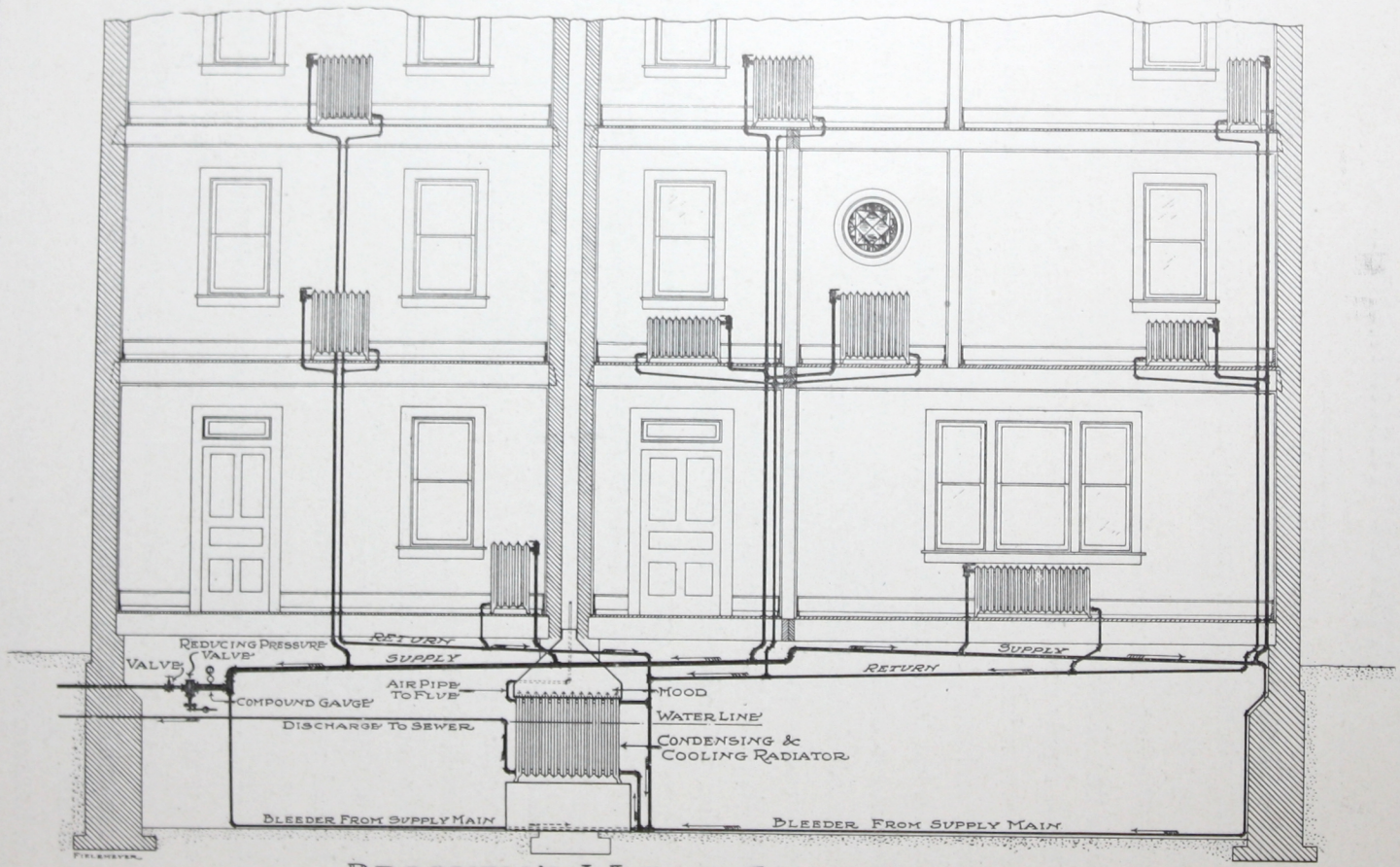
Supply and return connections for first floor radiators to be taken directly from basement mains.

Supply and return rising-lines may be run exposed or concealed in stud partitions or chases.

Lateral supply and return branches from risers may be run either above or below floors, but in all cases must have positive up-hill pitch.

Size of lateral supply-runs depends on size of radiators and their distance from risers; all upright supply pipes from ends of lateral runs are three-quarters inch up to vapor valve. All lateral return branches from union elbows are one-half inch, and return rising lines are not smaller than three-quarters inch.

In basement all lateral supply branches are not less than one size larger than the risers to which they connect.



BROOMELL'S VAPOR SYSTEM
SHOWING MANNER OF RUNNING PIPING IN CONNECTION WITH SUPPLY FROM STREET MAIN

Piping Connections from Street Main

The illustration on the opposite page shows the connections and piping for plant taking its supply from a street main. Just inside building wall place on supply pipe a controlling-valve and a reducing-pressure valve, for reducing the pressure from that carried on street main, to one pound or less. An accurate compound gauge is placed on the heating main close to the reducing-pressure valve.

From the low pressure side of reducing-valve the supply main runs on up-hill and down-hill grades to connect with risers and first floor radiators.

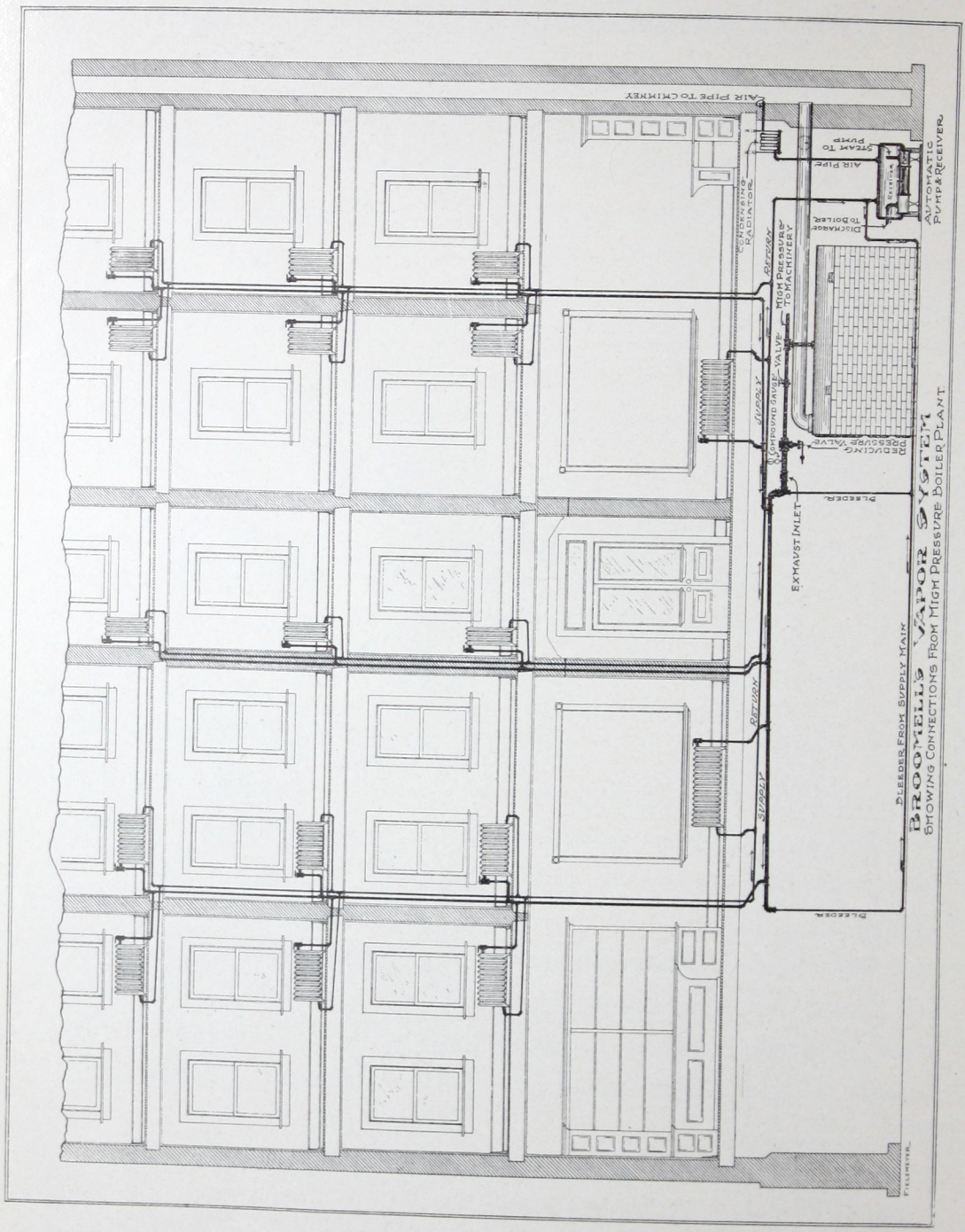
A condensing and cooling radiator, generally of the two column type, forty-five inches high is used. The upper part for condensing and the lower part for cooling surface. This radiator has four tappings, two on each end, top and bottom.

The returns from radiators are connected to one of the top outlets, and bleeders from supply mains to one of the bottom outlets on same end.

From top outlet of opposite end, an air line is extended to flue for exhausting air from system, and from bottom outlet a discharge pipe is extended to sewer or street return.

This condensing and cooling radiator is placed near to an available flue and the radiator provided with a metal hood, covering entire top of radiator, and connecting tightly to the upright flue. Where there is no flue in basement for air line and hood connections, it can usually be arranged to extend a special metal flue up through building.

Method of running mains, return, bleeders, risers, etc., is the same as described for typical boiler installation.


AIR PIPE TO CHIMNEY
CONDENSING RADIATORS
RETURN
SUPPLY
HIGH PRESSURE TO MACHINERY
VALVE
GROUND JOINT
REDUCING PRESSURE VALVE
DISCHARGE TO BOILER
AIR PIPE
STEAM TO PUMP
AUTOMATIC PUMP & RECEIVER
BLEEDER
EXHAUST INLET
BLEEDER FROM SUPPLY MAIN
BROOMELL'S VAPOR SYSTEM
SHOWING CONNECTIONS FROM HIGH PRESSURE BOILER PLANT

Connections from High Pressure Boiler Plant

In the illustration on opposite page, BROOMELL'S VAPOR SYSTEM is shown installed in connection with high pressure boiler plant.

The heating supply is taken from high pressure main, and is connected to heating main through reducing-pressure valve. From low pressure side of reducing-valve the heating main is extended on down-hill and up-hill runs as required.

An automatic Receiver-and-Pump is used, and returns from radiators, and bleeders from supply mains, are connected to one of the outlets on top of Receiver-and-Pump.

From the other outlet on top of Receiver, air-line is extended up to Condensing-Coil and from Condensing-Coil to chimney.

All of the exhaust steam from engines and pumps to be utilized, the exhaust to be connected into the heating-main on low pressure side of reducing valve, and to be provided with Grease-extractor and back-pressure valve.

Method of running mains, returns, bleeders, risers, etc., is the same as described for typical low-pressure boiler installation.

NOTE: The illustrations in this catalogue show the distributing supply mains run in basement.

BROOMELL'S VAPOR SYSTEM can be equally as well installed on the over-head system, with distributing mains run in attic space or at ceiling of top floor of building.

Recommended by Architects

A constantly increasing number of architects are specifying the BROOMELL VAPOR HEATING SYSTEM. They recognize that THE VAPOR SYSTEM is the most satisfactory solution of the heating problem. That VAPOR can be depended on to produce results which will be creditable not only to the heating contractor but to the architect himself.

By our plan, the architect is relieved of the responsibility for the engineering details. Moreover, the letting of the heating contract is simplified, since the architect passes upon but one set of plans and specifications instead of being under the necessity of examining a number of different layouts prepared by as many different heating contractors.

The architect can recommend THE VAPOR SYSTEM to his client with the fullest confidence that the System will prove satisfactory in operation and general results.

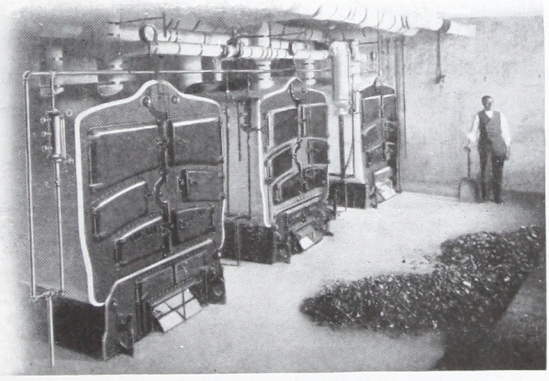
VAPOR HEATING COMPANY
PHILADELPHIA

Some Vapor Installations and Other People's Opinions



P. A. ROCKEFELLER RESIDENCE, GREENWICH, CONN.
J. W. Dederick, Contractor

Here is a veritable castle, this residence of P. A. Rockefeller at Greenwich, Conn., which Vapor keeps thoroughly warm through the rigors of New England winters. There are 113 radiators with a surface of 8586 square feet.



BOILER ROOM, ROCKEFELLER RESIDENCE

THE BROOMELL SYSTEM OF VAPOR HEATING installed in my home is proving a perfect success.

The job, from a mechanical standpoint, is all that could be desired, but as *heat* is the main thing one looks for in a *heating plant*, this is the point that will interest people most.

With sleet, snow and rain we have had in the last few days it is a luxury to have a perfectly uniform temperature of 70 degrees or more, if one wishes it. The apparatus is so simple, it is *fool proof*.

It makes no noise, as steam sometimes does. There is no possibility of *water freezing* in the pipes.

You can get the heat quicker and control it better than any other system I am acquainted with. I cannot recommend THE BROOMELL VAPOR SYSTEM too highly.

—GEORGE MUSE, Atlanta, Ga.

THE DEACONESS HOME,
Cincinnati, Ohio

159 radiators, 8198 square feet of surface.

T. J. Nichols & Co., Heating Contractors



I have used the VAPOR HEATING SYSTEM two winters at my home in Freeport, and find it very satisfactory, principally because the valves are handy and the temperature can be quickly regulated.

I do not lay stress on their draft regulator device for the furnace as they emphasize. I think to make that regulator work automatically, one would have to burn more coal than I use.

If I were building another house, I do not know of any system for heating that would suit me better than this.

H. L. CRANDELL, Jamaica, N. Y.



RESIDENCE, M. D. ARNOLD
Knoxville, Tenn.

22 radiators, 1646 square feet of surface.

Engert & House, Heating Contractors



J. B. ELAM, 1825 Monument Avenue, Richmond, Va.
W. P. Longworth &.Co., Heating Contractors

The VAPOR HEATING SYSTEM installed by you last fall in my residence, 1825 Monument Avenue, this city, is entirely satisfactory.

I am convinced of the advantages possessed by your VAPOR SYSTEM over any other that I know of.

My large house, exposed on all sides, has been most thoroughly warmed in the coldest weather during the past winter, and with but little more fuel than was required for the much smaller house formerly occupied, under another system.

I find the VAPOR SYSTEM simple, safe, prompt, economical and cleanly and my friends who are using it concur in this commendation.—J. B. ELAM, Richmond, Va.

During the past five years, I have lived in houses with various heating plants but believe that the VAPOR HEATING plant installed in my house is far superior to any other system of heating. It is easily taken care of; there is absolutely no noise in its operation, and with very little care an even temperature can be maintained in all parts of the house, the third floor as well as the first.

I was very skeptical about this system of heating at first, as you know, but am very glad now that I decided to put it in. It has been one of the main factors toward making the new house thoroughly comfortable.

I am hardly in position to state whether or not the plant requires less fuel, but think that in mild weather there would be a saving along this line. The satisfaction which the plant has given has been such that I have not watched the question of coal consumption very closely. I could thoroughly recommend this heating system to any one who has the heating problem to solve.

F. H. CARPENTER, Minneapolis, Minn.



PHILADELPHIA SCHOOL OF DESIGN FOR WOMEN
James H. Windrim, Consulting Architect
J. W. Cuff & Co., Heating Contractors

"Reduction in quantity of coal"

The VAPOR HEATING plant installed in the building of the School of Design for Women, Philadelphia, has proven efficient and satisfactory.

The building is comfortably heated throughout. The apparatus supplants eight hot-air furnaces, which were used to heat the building by a pair of twin boilers, and the building is now uniformly heated, which it was not before. We look for considerable reduction in quantity of coal that was previously used.—JAMES H. WINDRIM, 1107 Walnut Street, Philadelphia.

"Great improvement over the hot water system"

The VAPOR SYSTEM installed in our store building has been very satisfactory. We have had at no time cause to regret the change which we made from the hot water system, which we previously used in the old building. We have been able to keep our offices warm in the coldest weather, and without forcing the apparatus at any time. The control of volume at every radiator by the vapor valve is certainly a great improvement over the hot water and steam heating system, which we had previously used.

FLECK BROS. CO., Plumbing Supplies, 121 South Fifth Street, Philadelphia



GETHSEMANE M. E. CHURCH, PHILADELPHIA
Krieble & Co., Philadelphia, Heating Contractors

"Without continual bother with boiler"

I am very glad, indeed, to express my entire satisfaction with the BROOMELL VAPOR SYSTEM OF HEATING installed in my residence. I have never had any cause to realize the outside conditions of the weather, owing to the even temperature which it is possible to maintain without any continual bother with my boiler.

Any one looking for an economically and a delightfully heated home should install the BROOMELL VAPOR SYSTEM OF HEATING.—F. T. CHANDLER, Lansdowne, Pa.

"Even, comfortable temperature"

I made inquiries amongst those who had been using BROOMELL'S PATENT SYSTEM OF VAPOR HEATING, and heard nothing but favorable reports.

Under the circumstances, I had my home, 1901 Spring Garden Street, equipped with indirect system of VAPOR HEATING, and am prepared to testify to the good results obtained therefrom. My house is exposed on all four sides, notwithstanding which I am able to keep up an even, comfortable temperature in every room.—PENROSE FLEISHER, Philadelphia.



"One-half less fuel"

Comparing the coal consumption of a year ago with this winter, we consumed with the old steam plant from December 1st, 1902, to January 11th, 1903, an average of 1950 lbs. of pea and buckwheat coal per day, as against 1330 lbs. of buckwheat coal during the same period this winter, and from January 11th, 1903, to February 23d, 1903, an average of 1030 lbs. pea and buckwheat coal per day, as against 1135 lbs. buckwheat covering the same period this year. We not only burn cheaper fuel with the VAPOR SYSTEM, but also consume, as the above figures will show, about one-half less fuel during a winter that is very much more severe.

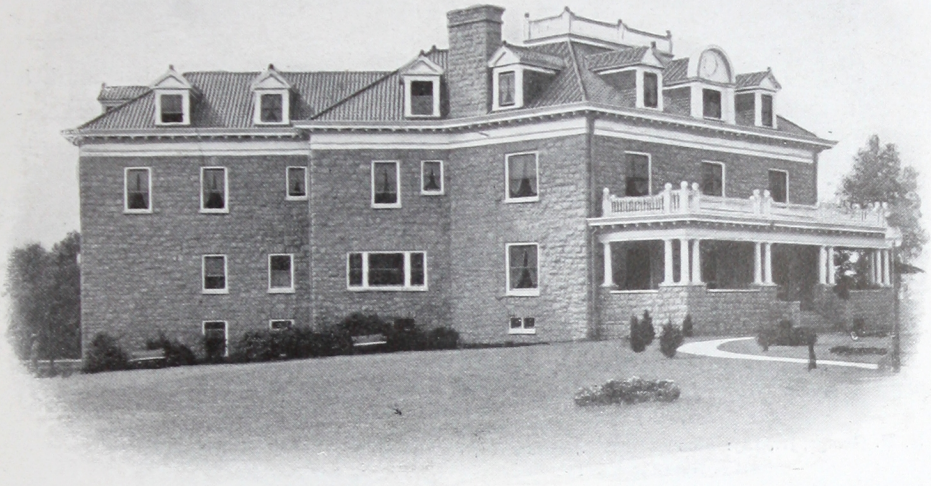
JOHN RUDDLE, The Lehigh Coal and Navigation Company, Mauch Chunk, Pa.



WHITNEY MANUFACTURING COMPANY, HARTFORD, CONN.

Wm. A. Boring, Architect

Hartford Heating Co., Heating Contractors



RESIDENCE OF GEO. L. BODENSTEIN, FORT WASHINGTON, PA.
Krieble & Co., Heating Contractors

"I am saving coal"

VAPOR HEATING continues to give good satisfaction. I take pleasure in informing you that I have still the first complaint to make. My home at Ft. Washington, Pa., has 22 rooms, and is exposed on all sides, yet I have no difficulty in maintaining an even temperature in every room. I am also well satisfied that I am saving coal by using your system.

GEO. BODENSTEIN, Bodenstein & Kluemmerle, Inc., Philadelphia



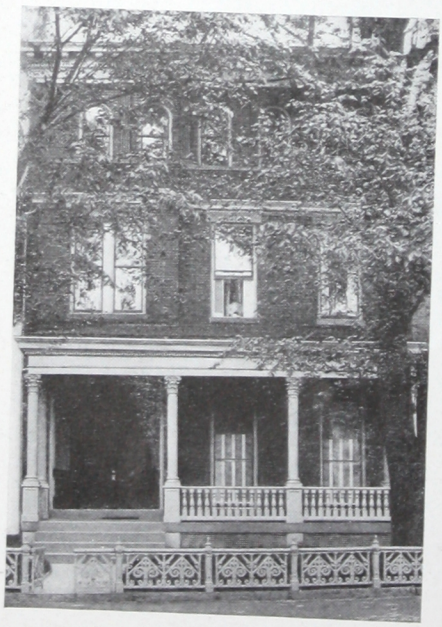
F. P. HOGAN, First Avenue and Madison Street, Spokane, Washington
Preusse & Zittel, Architects — M. Isbister Heating & Plumbing Co., Heating Contractors



H. H. George, Jr., 1831 Monument Ave., Richmond, Va.
Albert F. Hunt, Architect
W. P. Longworth & Co., Heating Contractors

VAPOR heat has been satisfactory in every way. The heat is certainly pleasant and I do not think there could be any improvement.

—MRS. JAMES LEIGH JONES
2034 Monument Ave., Richmond, Va.



W. R. Meredith, Esq., Richmond, Va.
W. P. Longworth & Co., Heating Contractors

The VAPOR HEATING plant installed by W. P. Longworth & Co., has been perfectly satisfactory in every way and I heartily commend it to the public.

—H. H. GEORGE, JR.
Richmond, Va.



Mrs. Jas. Leigh Jones, 2034 Monument Avenue
Richmond, Va.
W. P. Longworth & Co., Heating Contractors

I installed the VAPOR HEATING SYSTEM in my residence, 820 Park Avenue, this city, several years ago and am entirely satisfied with it. I take pleasure in recommending it.

—WYNDHAM R. MEREDITH, Richmond, Va.



Col. John S. Harwood, 2000 Monument Ave., Richmond, Va.
W. P. Longworth & Co., Heating Contractors

"Recommended it to several friends"

The VAPOR HEATING Apparatus installed in my residence has given entire satisfaction. My candid opinon is that it is decidedly the most desirable method of heating. I think so highly of it that I have recommended it to several of my friends, who have installed similar plants and are equally as much pleased as I.—JOHN S. HARWOOD,
Richmond, Va.

The VAPOR HEATING SYSTEM has given entire satisfaction.

I find it very little trouble to run, besides being more economical than any heating system I have hitherto tried.—HARVEY C. BROWN,
111½ Grove Avenue, Richmond, Va.



H. C. Brown, 111½ Grove Avenue
Richmond, Va.
W. P. Longworth & Co., Heating Contractors



F. T. Sutton, 1305 Grove Ave., Richmond, Va.
W. P. Longworth & Co., Heating Contractors

"Would not be without it for any consideration"

I wish to say that the VAPOR HEATING SYSTEM installed in my residence has given entire satisfaction. Would not be without it for any consideration.

The whole house has been kept comfortable all the winter, and I was surprised to find a few days ago in examining my coal bills that we had used no more coal than we have usually consumed with the two Latrobes which we had, before putting in the VAPOR SYSTEM.—F. T. SUTTON,
Richmond, Va.



HOTEL WARWICK, NEWPORT NEWS, VA.
Broomell, Schmidt & Stacey, York, Pa., Heating Contractors

"Exhaust steam heats entire hotel"

It gives me pleasure to state that the VAPOR HEATING SYSTEM which was installed in our Hotel Warwick has always given perfect satisfaction, and I cannot commend it too highly to those who seek a first-class heating system. It is economic to the highest degree, for, except in rare instances, the exhaust steam from our electric plant heats our entire hotel.—L. B. MANVILLE, Supt.

Old Dominion Land Company,
Newport News, Va.



CANNON FLATS, RICHMOND, VA.

Wm. C. West, Architect

W. P. Longworth & Co., Heating Contractors



SEWARD, Washington, D. C., 149 radiators, 5389 sq. ft. of radiation

W. S. Plager, Architect

Cyrus B. Rees, Heating Contractor

Would say that we have installed two jobs, using the VAPOR SYSTEM OF HEATING, one for Mr. George W. Corner of Roland Park and one for Mr. J. Edw. Whiteman of Mount Washington, Md.; both of which have been very satisfactory and economical in coal consumption.

WM. E. WOOD COMPANY, CHARLES J. WOOD, President, Baltimore, Md.

The VAPOR HEATING plant purchased from you for our new banking house, has given perfect satisfaction. We have found it simple, economical in the use of fuel, and in every way most desirable.

We do not hesitate to commend it to our friends.—JAS. C. SELF, Cashier, Greenwood, S. C.



BURLINGTON, Washington, D. C., 475 radiators, 15645 sq. ft. surface, 4 boilers, 18000 sq. ft. capacity
T. F. Schneider, Architect
Hubbard Heating Co., Heating Contractors



DECATUR, Washington, D. C., 157 radiators, 5100 sq. ft. surface
George S. Cooper, Architect
Cyrus B. Rees, Heating Contractor



CONVENT OF THE
SISTERS OF THE GOOD SHEPHERD
Highlands, Ky.

Schofield & Rabe, Architects
John Conners, Cincinnati, Ohio, Heating Contractor

The VAPOR HEATING plant which you put in our building in this city has now been used for several seasons, and has given entire satisfaction, performing all that was promised of it.

WM. W. CHAMBERLAINE, Norfolk, Va.

"A delightfully heated home"

I would like to tell you how much pleased I am with the VAPOR SYSTEM which you put in my house. I have never had any cause to realize the outside conditions of the weather, owing to the even temperature which it is possible to maintain without any continual bother with my boiler. Anyone looking for an economical plant and a delightfully heated home should use the BROOMELL VAPOR SYSTEM OF HEATING.—R. B. L. FLIMING, The Plains, Va.

"Free from annoyance of thumping pipes"

After two winters' use of your heating system in the "Marion Apartment House," and for a short period in my own home, I find it economical in operation, free from the annoyance of thumping pipes, with no air or other valves to cause leaks or drips; perfectly controllable as to amount of heat desired at different seasons and in different rooms requiring different temperatures. In short, it has proven perfectly satisfactory to me. I prefer it to any heating system of which I have any knowledge.—J. PARKE POSTLES, American Leather Company, Wilmington, Del.



HOLY FAMILY CHURCH
AND SCHOOL
Dayton, Ohio
Jos. E. Kinninger, Architect
McDermont & Clemens,
Heating Contractors

G. H. McHENRY, RESIDENCE
Dayton, Ohio
Robert E. Dexter, Architect
McDermont & Clemens, Heating Contractors





FIRST ENGLISH LUTHERAN
CHURCH
Dayton, Ohio
Peters, Burns & Pretzinger,
Architects
McDermont & Clemens,
Heating Contractors



C. B. WOLF, RESIDENCE
Dayton, Ohio
W. H. Stacey, Architect
McDermont & Clemens
Heating Contractors



WILLIAM STROOP, RESIDENCE
Dayton, Ohio
Chas. I. William, Architect
McDermont & Clemens
Heating Contractors



EMANUEL'S CHURCH
SCHOOL
AND BROTHERS'
RESIDENCE
Dayton, Ohio
7216 sq. ft. surface
McDermont & Clemens
Heating Contractors



MILLER FLATS, Cincinnati, Ohio
John Conners, Heating Contractor

"Architects recommend the VAPOR SYSTEM"

We are pleased to say that the BROOMELL PATENT SYSTEM OF VAPOR HEATING is the most satisfactory low pressure heating system which we have found. We are recommending it to our clients and specifying it regularly where a low pressure system is required. The way in which your Company stands back of this system adds pleasure to its use. As architects, we have supervised the installation of the system in a central heating plant where a group of four large buildings was heated, with excellent results. We are about to have the VAPOR SYSTEM installed in several other buildings, viz: the Church, School, Convent and Rectory of "The Holy Trinity," Central Falls, R. I.; St. Patrick's R. C. Church, Providence, R. I.; St. Michael's R. C. Church, Providence, R. I.; Academy and Convent of the Holy Union of the Sacred Hearts, Fall River, Mass.; Santo Christo R. C. Church, Fall River, Mass.—MURPHY, HINDLE & WRIGHT, Architects, Providence, R. I.

The VAPOR SYSTEM OF HEATING is the only way to heat a residence. Your first cost is somewhat more, although the difference in amount of fuel used will make that up in a year or so. In our furnace all last winter we used slack coal and had good satisfaction. Would advise the VAPOR SYSTEM, for economy and getting what you expect—heat.

Yours truly,
J. E. HUGG, Humphrey, Neb.

ST. PATRICK'S CHURCH PARSONAGE
Cumminsville, Ohio
Jos. E. Kinninger, Dayton, Ohio, Architect
John Conners, Cincinnati, Ohio
Heating Contractor



CEDAR RAPIDS BUSINESS COLLEGE
Cedar Rapids, Iowa
Dieman & Fiske, Architects
Messner & Company, Heating Contractors



"System of controlling heat—best"

THE BROOMELL PATENT SYSTEM OF VAPOR HEATING installed in the Iowa Odd Fellows' and Orphans' Home located at Mason City, Iowa, has given perfect satisfaction.

The system of controlling the heat, and the economy in producing same, is the best we have ever seen. We take great pleasure in recommending THE BROOMELL PATENT SYSTEM OF VAPOR HEATING to any one desiring a perfect heating system.—A. A. CROSSLEY, Trustee of the Iowa Odd Fellows' and Orphans' Home, Mason City, Iowa.



L. W. HUTTON, First Avenue and Washington Street, Spokane, Washington
John K. Dow, Architect
M. Isbister Heating & Plumbing Co., Heating Contractors

F. P. HOGAN
First and Lincoln Streets
Spokane, Wash.
155 radiators, 9802 sq. ft. surface
M. Isbister Htg. & Plumb. Co.
Heating Contractors



"Required but ten minutes to heat all radiators"

Your VAPOR SYSTEM recently installed in my building 21 East 17th St., has more than exceeded my expectations. From the time we started the fire in the boiler until all the radiators were thoroughly hot in the entire building required only ten minutes, and this was accomplished by using only one ounce steam pressure in the boiler. I consider this system without exception the best and most economical. This testimonial is entirely voluntary and unsolicited, you are at liberty to use it if you so desire. Very truly yours,

W. D. STEWART, Townsend Building, New York

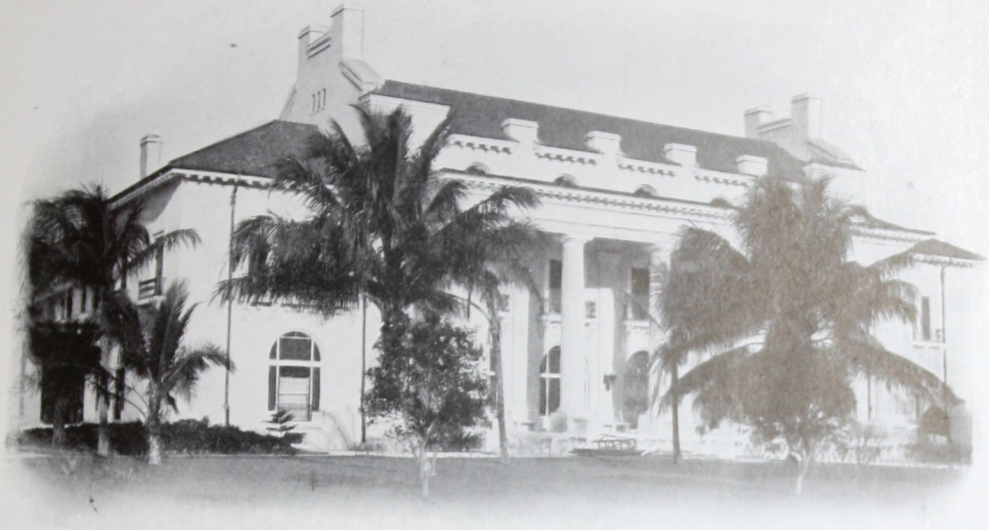
The VAPOR HEATING plant you installed in my hotel is in every way satisfactory, and the consumption of coal very small for the amount of radiation. You have certainly fulfilled your contract to my entire satisfaction.—L. E. WAGENER, Binghamton, N. Y.

"Burn less coal"

Instead of freezing in winter, in our 125-foot-front up-on-a-hill property, we are absolutely comfortable, and in all parts of the house, no matter what exposure; and the pleasing fact is, burn less coal than with the hot air system, which I discarded. Both the indirects and the directs work to our entire satisfaction.—SAMUEL ECKERT, Devon, Pa.

CHAS. SWEENY, RESIDENCE
Spokane, Wash.
M. Isbister Htg. & Plumb. Co.
Heating Contractors





PALM BEACH, Florida, Residence of H. M. Flagler

Carrere & Hastings, New York City, Architects

The VAPOR HEATING plant installed in my residence at Palm Beach, Fla., is giving complete satisfaction. I know of but one improvement that could be made upon it, and that would be to invent a furnace that would not require any fuel.—H. M. FLAGLER, 26 Broadway, New York

The VAPOR HEATING plant installed in my residence, 117 S. Alabama Street, Butte, Montana, has been continuously used by me during the most severe winters known to Montana for many years. The heating plant gave perfect satisfaction during the coldest weather. We can regulate it to maintain a heat of within a few points of any desired temperature.

One of the advantages of the plant is that we can build a fire at nine o'clock at night and have a good warm house within a very few minutes after opening the drafts of the furnace in the morning. We did not have one instance of the fire dying out or getting so low that it could not be quickly revived in the morning.

I believe that the plant is economical in the use of fuel.—R. L. CLINTON, Butte, Montana



SAN JOAQUIN COURT HOUSE, STOCKTON, CALIFORNIA
Russel Vail Eng. Co., Heating Contractors

"Dividends in comfort"

The point that most impresses me about the VAPOR SYSTEM is its flexibility—its responsiveness to the radical temperature changes characteristic of our climate. On mild days Vapor gives out a gentle, comfortable heat; and when the weather is severe, there is heat in abundance to meet all requirements.

When I first heard of VAPOR, a hot-water plant had been partly installed in my residence at Bala, Pa. In addition to the cost of VAPOR I had to pay partly for the hot-water plant. It came high, in money,—but the dividends in comfort make the cost look cheap.

J. C. ARMSTRONG, Bala, Pa



COLUMBUS HOSPITAL
Great Falls, Montana
"Central Heating Plant."
William E. Donovan, Architect
John A. Collins, Heating Contractor

"13,000 square feet of radiation heated uniformly"

We take pleasure in writing with reference to the BROOMELL SYSTEM OF VAPOR HEATING which we had installed in our buildings. For ninety-nine days we figured the cost for coal to run the plant, and found it was $340.08. This furnished heat to about 13,000 sq. ft. radiation, all which heated uniformly without any noise or leakage, or any air valves to be bothered with.

We also figured the cost of running a hot-water heating plant which we had removed to install your plant, for the same number of days, ninety-nine, and found it cost $345.31; at the time we were heating, or trying to do so, about 8000 sq. ft. of radiation. The additional radiation has been used in the new building erected last summer, which was the Nurses' Home and addition to the Maternity Hospital. Our buildings now cover over 300 feet frontage. The main hospital building is a four-story structure, including basement, which is heated. The Nurses' Home is the same, only the basement is not heated. The Maternity is a three-story building, including basement, which is not heated. Our boiler room is located about the centre of buildings directly in rear of same, where we have two 100 horse-power boilers of the Scotch Marine type, internally fired with the Morrison corrugated furnace. In addition to these we have a 36"x12' tubular boiler, which we use for high pressure work, running laundry machinery and heating water for general uses; also for sterilizing and flue ventilation purposes, all of which has been taken care of with the fuel we have figured, so you can see, without this addition, the cost for heating would have been a great deal less.

We are very much pleased with the system, and have no hesitancy in recommending it to those who contemplate putting in a large heating plant. The absolute certainty of being able to heat the buildings at all times has been demonstrated during the last three weeks, with the thermometer registering below zero, and during one real cold snap over thirty degrees below, we experienced no difficulty in keeping our buildings at the right temperature.

Columbus Hospital
Sister Mary Julian
Great Falls, Montana.



MONTANA CLUB, Helena, Montana
Cass Gilbert, Architect. John Sturrock, Heating Contractor

MONROE COUNTY COURT
HOUSE
Stroudsburg, Pa.
H. C. Archibald, Jr.
Heating Contractor





LUKENS IRON & STEEL CO.
Coatesville, Pa.
Cope & Stewardson
Architects

JOHN DUNLAP
Wayne, Pa.
F. A. Gugert
Architect
Wayne Elect. Lt. &
Steam Heat. Co.
Heating Contractors





CENTENARY M. E. CHURCH
J. C. F. Trachsel, Heating Contractor

"Easy to run"

The VAPOR SYSTEM has proven entirely satisfactory. Our church is large, much glass, and yet in the coldest days the VAPOR SYSTEM gives us all the desired heat and is easy to run, and we cheerfully recommend it. The coal consumption is very satisfactory.—JOSEPH A. HUDSON, Chairman Committee, Centenary M. E. Church, Philadelphia.



Residence of S. G. WILDS
Smyrna, Del.

Geo. W. Taylor
Heating Contractor



RESIDENCE OF T. A. SPERRY, CRANFORD, N. J.
John L. Reid, Heating Contractor

"In the residence of Mr. C. W. Post"

I installed the VAPOR SYSTEM in Mr. Post's summer home. It proved very satisfactory. I have had considerable experience in directing steam plants and I believe that the VAPOR SYSTEM saves about 22 per cent. in the consumption of fuel.—L. M. BROWN, Superintendent to Chairman Postum Cereal Co., Ltd., Battle Creek, Mich.

Your VAPOR HEATING plant installed in the building, 6 E. 77th Street, has proved a great success. Since I got the new damper put on, it has worked to perfection, one ounce being sufficient in the coldest weather.—N. J. JANSEN, 211 E. 76th Street, New York City.



RESIDENCE OF DR. W. A. STEWART, PITTSBURGH, PA.

Century Architectural and Engineering Co., Architects — Snively Heating Co., Heating Contractors

I do not believe that there is anything on the market equal to the VAPOR SYSTEM for ease of regulation, economy of fuel and results. When the best is wanted, I recommend "VAPOR."

W. PARKE CUMMINGS, Central Machine Works, Lancaster, Pa.



WAYNESBORO BANK

Waynesboro, Penna.

Harry E. Yessler, York, Pa., Architect

Hagerstown Heating Company, Hagerstown, Md., Heating Contractors



YORK HOSPITAL, YORK, PA.

J. A. Dempwolf, Architect

Broomell, Schmidt & Stacey Co., Heating Contractors

I had enough confidence in your claims for VAPOR heating to rip out the hot-water plant in my residence at Swarthmore, Pa., and install VAPOR instead. Three years' experience shows that my confidence was not misplaced. VAPOR is in every way superior to hot-water.

With the exception of a defective valve, which was replaced in a few minutes by my gardener with new valve which you sent me, the system has never gone wrong. Nothing has gotten out of order. It has not cost me a penny for repair work.—H. I. IRELAND, Swarthmore, Pa.



BRUNER BUILDING

Stockton, Cal.

Coates & King,

Architects

Russel Vail Eng. Co.

Heating Contractors



RESIDENCE OF DANIEL BAUGH, 16th and Locust Streets, Philadelphia
Hazlehurst & Huckle, Architects

The VAPOR SYSTEM installed in my house was adopted to a rather complicated two-boiler plant where steam under unusually high pressure for house heating had proved inadequate.

Your proposition to introduce VAPOR, *with a far less number of ounces* than I had been using pounds pressure, was rather *startling*, and I could not help being skeptical on general principles. The information and experience then available to form a judgment made me doubt even against my wishes and hopes.

The results have *satisfied me* that the VAPOR SYSTEM amply fulfills all your claims; indeed, I am convinced that in regard to *uniformity of heat*, *prompt effect* and *economy of fuel*, it is *the best* and most "*common-sense*" plan of heating now in use.

Your statement of what the improvement would be, when you made a preliminary survey of my plant at my request, now seems to me *rather conservative*.

While the work was in progress, and since its installation, your ready assistance in everything pertaining to domestic convenience, as well as in securing the best practical execution of the work, merits my high commendation.

(Signed) DANIEL BAUGH,
Delaware River Chemical Works, Baugh & Sons Company, Philadelphia



HIGHLAND COURT, HARTFORD, CONN.

Bayley & Goodrich, Architects Hartford Heating Co., Heating Contractors

The BROOMELL VAPOR HEATING SYSTEM which we installed in the Highland Court Apartments, having about 10,000 feet of radiation, has proved to be all and more than the agents of the Company promised, especially in economy of fuel. The writer lives in the building and has watched the heating closely. This system really surpasses those of steam and hot water in economy and efficiency.

—BAYLEY & GOODRICH, Hartford, Conn.

THE IRELAND SERVICE, PHILADELPHIA